

## The authorship and date of the familial nomen *Ranidae* (Amphibia, Anura)

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**The anuran familial nomen *RANIDAE* has been credited with several authorships and dates in the recent decades. Some of these changes were due to the rediscovery of older works, and some to modifications in the Rules of the Code. The rediscovery of the work of BATSCH (1796) brings a new change in this respect, as this nomen was indeed created in this book. This is the first familial nomen of amphibians created, whereas *TESTUDINIDAE* Batsch, 1788 is the first familial nomen of reptiles.**

The zoological *Code* (ANONYMOUS, 1999) recognizes three “groups of names” or better “nominal-series” (DUBOIS, 2000) the species-, genus- and family-series. Family-series nomenclature (i.e., nomenclature of taxa at ranks family, superfamily, subfamily, tribe, subtribe and additional intermediate ranks) is regulated by the *Code* but these Rules have regularly been ignored by some zootaxonomists. Some believe that no Principle of Priority applies to these nomina and that the valid nomen of a family-series taxon is fixed by “usage” or “consensus”. Others imagine that any such nomen should be credited to the first publication where it was used with its now correct spelling, e.g., *RANIDAE* for the family including the genus *Rana* Linnaeus, 1758. Still others think that, to be valid, a family-series nomen must be based on a generic nomen considered valid, and must be changed when the latter becomes invalid (e.g., for being discovered to be a junior synonym). All of this is wrong. The valid nomen of a family-series taxon is the senior one, among all of those potentially available for the taxon (i.e., based on generic nomina now referred to the taxon), except if it is a junior homonym or based on a generic nomen which is itself a junior homonym, and irrespective of the validity of the generic nomen on which it is based (type genus or nucleogenus); and the author and date of any family-series nomen are those of the work where a nomen based on this nucleogenus was coined for a taxon of any rank in the family-series, whatever its ending, under the condition that this nomen was clearly in the nominative plural. The rationale for these Rules was discussed in detail by MYERS & LITVIN (1962) and DUBOIS (1984, 1987*b*, 2005*a*, 2011).

Another rather frequent mistake in zoological nomenclature consists in ignoring the Principle of Coordination, which states that all family-series nomina based on the same

generic nomen (e.g., family *RANIDAE*, subfamily *RANINAE*, superfamily *RANOIDEA*, tribe *RANINI*, subtribe *RANINA*, etc.) have the same author and date, that of the first nomen ever proposed for a family-series taxon containing the genus at stake. This Rule is too often ignored, even in works by professional zoologists (e.g., FRÔTS, 1957; ALBOUY & CAUSSANEL, 1990; GASC, 1990; MEIN & GINSBURG, 1997) and, at least for some entries, in databases dealing with zoological phylogeny, taxonomy and nomenclature (ANONYMOUS, 2011; BRANDS, 2011).

The familial nomenclatures of rather few zoological groups have been surveyed extensively for the valid nomina of taxa and especially for their valid authorships and dates. In many groups, nomina are used following some kind of consensus, and no authors and dates are given to nomina. Exceptions include the mammals (WILSON & REEDER, 2005), the birds (BOCK, 1994), some mollusks (BOUCHET & ROCROI, 2005, 2010) and crustaceans (NG et al., 2008). In herpetology, the only groups to have been exhaustively and seriously treated are: (1) the recent amphibians, that were covered by DUBOIS (1983, 1984, 1985, 2005*b*), followed, but for some mistakes (see DUBOIS, 1987*a*), by FROST (1985, 2011), (2) the chelonians, treated by BOUR & DUBOIS (1985, 1986), followed, but for some mistakes, by RHODIN et al. (2008, 2009, 2010); (3) some snakes (Mc DIARMID et al., 1999). No such comprehensive treatment has been published so far for the other groups of “reptiles”, which explains that regularly corrections have to be published concerning the authorships and dates of some family-series nomina (e.g., DUBOIS & BOUR, 2010*b*).

Even in the groups that have been seriously surveyed, it is not rare that earlier uses of family-series nomina are discovered for well-known groups. This is easy to understand. The earliest recognized family-series taxa were based on Linnaean generic nomina made available in the 1758 and 1766–1767 editions of LINNAEUS' *Systema Naturae*. The latter works having been well-known to all zoologists since their publication, any author could coin a family-series nomen based on a generic nomen for a taxon including this well-known genus. Linnaeus did not use the rank family (DUBOIS, 2007) and there is no official starting date for the use of family-series nomina based on generic nomina in zoology. The earliest publication using this system that we know of is that of BATSCH (1788, 1789), where this author coined 17 familial nomina that are duly available under the current Rules of the *Code* and that should be credited to him, not to subsequent authors who used the same nomina (DUBOIS & BOUR, 2010*b*).

In the early days of zoological nomenclature, authorship and date of nomina were not strictly regulated and were often ignored because of a widespread “mihilism” (BRUUN, 1950, DUBOIS, 2008), i.e., a propensity of some authors to claim authorship for some nomina although they had not coined them but just “redefined” them. Now we have strict Rules, and nomina are created once and for all and cannot be “redefined”, because of the existence of what has been called the *Principle of Nomenclatural Foundation* (DUBOIS, 2011). In the three nominal-series covered by the *Code*, nomina are “defined” only through their onomatophore, not by any intensional or extensional definition (DUBOIS, 2011). Therefore, if two different authors create independently (i.e., in the ignorance of the other's work) two family-series based on the same generic nomen, the latter is the onomatophore of both and they are strict objective synonyms or *isonyms* (DUBOIS, 2000). It could be argued that in such a case the two nomina are indeed independent homonymous and isonymous nomina, but this would have no practical consequence on the valid author and date of the family-series nomen, which would in all cases remain that of the first published one. Practically, it would be very difficult, if not

impossible in some cases, to ascertain whether the second author had used the nomen proposed in an earlier work by the first author, or whether he/she thought he/she had indeed coined a "new" nomen, because most authors of that time (and in fact still nowadays – even in taxonomic revisions, faunistic lists, catalogues of specimens or taxa, etc.) just mentioned family-series nomina but not their authors and dates. It is therefore much simpler, and without any nomenclatural consequence, to consider that any family-series nomen based on a given generic nomen has been coined only once, in the first publication where it appeared, and that any subsequent appearance of this nomen, either identical or modified in its ending (e.g., *-IDAE* instead of *-IDAF*), is not a new nomen but respectively a chresonym or an *aponym* of the *protonym* used in the first publication (for the definitions of these terms, see DUBOIS, 2000). This guideline was used in all our previous works (e.g., DUBOIS, 1984, DUBOIS & BOUR, 2010*b*) and we use it here.

The case of the family *RANIDAE* is a very enlightening one. Although this nomen, under various spellings, has been used continuously by all authors since 1825 for a family including the genus *Rana* Linnaeus, 1758, its authorship and date have changed regularly, in part because of incomplete bibliographic surveys by authors, and in part because inappropriate changes implemented in the *Code* in 1985 (for a discussion of this point, see DUBOIS, 1987*b*, 2011). The authorship and date traditionally credited to this nomen (e.g., DOWLING & DULLMAN, 1974–1978) was BONAPARTI (1831), because this author was thought (in error) to have been the first one to use the correct spelling *RANIDAE* for this family. DUBOIS (1984) pointed out that the spelling *RANIDAE* had been used already by BOJE (1828), but, as established by DUBOIS (1981), the nomen had in fact been created by GRAY (1825) under the spelling *RANADAE*. However, an earlier nomen, *RANARIDIA* Rafinesque-Schmaltz, 1814, based on *Ranaria* Rafinesque-Schmaltz, 1814, an invalid neonym (nomen novum) for *Rana* Linnaeus, 1758, was also available for this family. According to the *Code* then in force (ANONYMOUS, 1964), the family had to be named *RANIDAE* Gray, 1825 (1814) and its eponymous taxa (*RANOIDEA*, *RAMINAE*, *RANINAE*) had to be credited with the same authorship and date (DUBOIS, 1981, 1984). The subsequent discovery (DUBOIS, 1985) that GOLDFUSS (1820) had already recognized a family *RANAE* should have led to a new authorship and date for the family, as *RANIDAE* Goldfuss, 1820 (1814), but the third edition of the *Code* (ANONYMOUS, 1985) modified the Rules in force in such cases, so that the valid nomen became *RANIDAE* Rafinesque-Schmaltz, 1814 (for details, see DUBOIS, 1985). Here we report on a new discovery that again modifies the authorship and date of this familial nomen.

The work of BATSCH (1788) has never been completely forgotten (see e.g. STJEGHER, 1907), but it was not until the resurrection by BOUR & DUBOIS (1985) of the family-series nomen *TESTUDINIS* Batsch, 1788 as the valid nomen for the family *TESTUDINIDAE* that it was used as the first identified source of available family-series nomina in zoology. DUBOIS & BOUR (2010*b*) confirmed this fact and pointed to 16 other available and valid familial nomina over the whole of zoology coined by BATSCH (1788, 1789) that had been ignored until then.

BATSCH (1788, 1789) was not consistent in the derivation of his familial nomina. These nomina belong in three categories (DUBOIS & BOUR, 2010*b*). Some were clearly based on an available generic nomen recognized by Batsch as designating a valid genus: these *rhizonymys* (DUBOIS, 2006*b*) are correctly formed and they are available nomina under the *Code* or *hoplonymys* (DUBOIS, 2000). Others were not based on generic nomina: such *arhizonymys*

(DUBOIS, 2006a) are incorrectly formed and are unavailable nomina under the *Code* or *anoplonyms* (DUBOIS, 2000). Finally, others are based on available generic nomina, but the latter were not used by Batsch as valid in the new family-series taxon; these nomina can be called *cenorhizonyms* – from the Greek *κενός* (*kenos*), “empty, vain”, *ρίζα* (*rhiza*), “root” and *ὄνομα* (*onoma*), “name”. The status of such nomina is addressed in Article 11.7.1.1 of the *Code*, which states that, for a new family-series nomen to be available it must be based on a generic nomen “then used as valid in the new family-group taxon”. The meaning of “then” in this Article is questionable, but we here follow the interpretation that we presented elsewhere (DUBOIS & BOUR, 2010b), according to which the generic nomen must be used as valid in the new family-group taxon as recognized in the work where its nomen is created. According to this interpretation, *cenorhizonyms* are also *anoplonyms* under the *Code*.

The 17 family-series *rhizonyms* in BATSCH (1788, 1789) are doubtless nomenclaturally available. They have priority over all other nomina proposed later on for the same taxa and should replace them. As these changes in authorships and dates do not imply any change in the nomina of the family themselves, they can and must be implemented without delay in all the zoological groups concerned (DUBOIS & BOUR, 2010b).

Another work of BATSCH (1796) seems to be still rarer than his first two books. It was mentioned in catalogues in the 19<sup>th</sup> century, but forgotten in the 20<sup>th</sup>. It was “rediscovered” in the 21<sup>st</sup> century (CHANDRA, 2005, RHODIN et al., 2008) by authors who mentioned it but did not discuss its nomenclatural implications in zoology. This work was recently digitalized and made available to all interested zoologists by “Die Bayerische Staatsbibliothek Munchen” (<<http://reader.digitale-sammlungen.de/resolve/display/bsb10074788.html>>), so we had access to it. It so happens that this work contains two new available familial nomina, not mentioned in Batsch’s first work.

BATSCH (1796, 73) recognized a family *O.VINA*. This nomen, based on *Ovis* Linnaeus, 1758, has priority over *BOVIDAE* Gray, 1821 for the family and its subordinated taxa including the genus *Ovis*. As the nomen *BOVIDAE* has had a widespread use in zoology, it should be validated against *OVINA*; we will address this question in a distinct paper.

BATSCH (1796, 179) also recognized a family *RANINA*, based on *Rana* Linnaeus, 1758. The situation is clearer in this case. In 1788, Batsch had recognized a family “*BATRACHI*”, with the four frog genera *Bufo* Laurenti, 1768, *Hyla* Laurenti, 1768, *Pipa* Laurenti, 1768 and *Rana* Linnaeus, 1758. Although a generic nomen *Batrachus* Schaeffer, 1760 was available at that time (DUBOIS & BOUR, 2010a), it was a genus of “fishes” and it cannot be at stake here: the first frog generic nomen *Batrachus* was created by RAFINESQUE-SCHMALTZ (1814) and cannot be the basis for the stem of “*BATRACHI*” Batsch, 1788. The latter is therefore an *arhizonym* and *anoplonym* (DUBOIS & BOUR, 2010b). In contrast, the nomen *RANINA*, which BATSCH (1796) substituted for his nomen “*BATRACHI*”, being based on the generic nomen *Rana* Linnaeus, 1758 that he recognized as valid, is a *rhizonym* and *hoplonym*. It has priority over the nomen *RANARIDIA* Rafinesque-Schmaltz, 1814. This change is a very fortunate one, because it allows to credit again the family-series nomen *RANIDAE* (widely used, and at many different ranks) to a publication where it was indeed based on the generic nomen *Rana* Linnaeus, 1758 – and not on a neonym of the generic nomen nowadays considered valid for the taxon (for details and discussion, see DUBOIS 1987b, 2010).

Therefore *RANIDAE* Batsch, 1796 becomes the valid nomen of the family and of its eponymous taxa (*RANOIDEA*, *RANINAL*, *RANINI*, *RANINA*) if recognized as valid taxa.

In herpetology, BATSCH (1788) recognized four families in his classis *AMPHIBIA*. The nomen of one of them (*TESTUDINES* Batsch, 1788, for the single genus *Testudo* Linnaeus, 1758) was a rhizonym (based on the root of a generic nomen considered valid) and a hoplonym (available) and should now be used as the valid nomen of this family, as *TESTUDINIDAE* Batsch, 1788. The other three ("*BATRACHI*" Batsch, 1788; "*LACERTAE*" Batsch, 1788; "*SERPENTES*" Batsch, 1788) are cenorhizonyms (based on the root of a generic nomen considered invalid) and anoplonyms (unavailable), and are therefore without nomenclatural existence.

Eight years later, BATSCH (1796) kept the same taxonomy for his classis *AMPHIBIA* but modified the nomenclature of the families. He changed his family nomen *TESTUDINES* into *TESTUDINEA*; this is not a new nomen but just an aponym (derived form of nomen) of the protonym (original form of nomen) *TESTUDINES*, which therefore keeps the same authorship and date, i.e., Batsch, 1788. He also modified his family nomina "*LACERTAE*" and "*SERPENTES*" into respectively "*LACERTINA*" and "*SERPENTINI*"; these are also aponyms, but as they remain cenorhizonyms they remain anoplonyms and have therefore no nomenclatural existence. Finally, he replaced his nomen "*BATRACHI*" by the new nomen *RANINA*, which is a rhizonym and hoplonym, and becomes the valid nomen of the family.

*RANIDAE* Batsch, 1796 is the first familial nomen of amphibians ever created, whereas *TESTUDINIDAE* Batsch, 1788 is the first familial nomen of reptiles.

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